Fermilab

May 2, 2008

Young-Kee Kim
Niki Saoulidou
Eric Prebys
Bob Tschirhart

Dear Young-Kee, Niki, Eric, and Bob,

Thank you for your presentations at the recent Physics Advisory Committee (PAC) meeting. The PAC was clearly impressed by the role of neutrinos as the flagship program for Project X, and also by the recent efforts to define the potential of the options for flavor physics experiments.

The PAC made the attached specific comments.

The PAC endorsement of our efforts is helpful, and a positive comment on the quality of all your presentations.

Again, thank you.

Sincerely,

Piermaria Oddone

Attachment

cc: H. Montgomery
S. Holmes
R. Kephart
J. Appel
J. Strait
R. Dixon
V. White
G. Apollinari
S. Dodelson
L. Bauderdick
V. Shiltsev
R. Rameika
S. Dawson
M. Procario
J. Whitmore
D. Levy
F. Bernthal

Excerpt

Physics Advisory Committee Meeting

March 27-29, 2008

Comments and Recommendations

Introduction

The Committee heard status reports from many of the ongoing experiments, along with four proposals/LOIs/EOIs. In addition, it heard an update on Project X and the associated physics possibilities. A number of important areas of research, including US CMS, NOvA and ILC detector R&D, were not discussed in public session, but the Committee was briefed on these programs by Laboratory management.

The Committee recognizes that the unfortunate current budget situation makes this a difficult time for the Laboratory, and it commends both the management and staff for facing this challenge with grace and determination. The Committee is encouraged by the breadth of world-class physics results presented to the Committee at this meeting to hope that budget problems will be resolved soon.

The Committee is asked to consider experiments which could be a part of the long-range strategic plan for the Laboratory at its June meeting. This strategic plan will be formed in light of the P5 recommendations expected in May. At that time, the Committee will consider the suite of future physics possibilities in the post-Tevatron era, and make recommendations of relative physics priorities. In light of the strategic plan, and the need to await P5 recommendations, most formal recommendations are postponed until the June meeting.

Project X Physics Program

The Committee heard from Laboratory management on the work in development of Project X. To insure that all relevant input was obtained, the Lab has made many presentations to various agencies, review panels, and other forums, and has held a series of workshops to get input from the community. The Laboratory has done an excellent job on involving the university, laboratory, and international communities in the development of Project X. A well-defined accelerator project, with a possible physics program, is emerging.

This work has culminated in a document called the 'Golden Book' that includes descriptions of the proton source road map and the physics potential for programs based on neutrinos, muons, kaons, charm, and antiprotons. The 'Golden Book' represents a significant

step towards the understanding of the physics discovery potential of Project X. The Committee heard additional presentations based on the compiled information on the neutrino, muon, and kaon physics.

The Laboratory presented explorations of neutrino oscillations as the cornerstone of the physics effort. The Committee strongly supports the high priority of this program as the flagship physics for the Project X effort. The Laboratory, in anticipation of a possible program of neutrinos at DUSEL, and especially as DUSEL now contains an appropriate detector as part of its initial suite of experiments, is forming a group to understand the relevant accelerator and beam design issues. The Committee feels this is an appropriate effort. The Laboratory is making progress towards understanding the detector configuration options available for optimizing the physics program and their physics sensitivities. Now the Laboratory should concentrate on determining the best strategy for the detectors and their locations.

The Committee was impressed by the progress made on defining a world-class program in flavor physics as part of the Project X suite. These experiments are sensitive to physics beyond the standard model in unique ways, and they can probe very high energy scales. Since there are plans for exciting flavor physics experiments using muons and kaons throughout the world, the Committee encourages continued close communications with the international community for coordination and collaboration on these efforts.

This work is currently being considered by the P5 subpanel of HEPAP. The Committee looks forward to hearing their recommendations as input to the June meeting.